Jet Propulsion Laboratory
California Institute of Technology

AIRS User Services and Applications

AIRS Science Team Meeting

Tuesday May 21, 2013

Sharon Ray, JPL

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AIRS User Services

Ed Olsen reports:

- As of **April 2013** there are **820** unique and active registered AIRS data users

- As of April 2013 Users have submitted a total of **658 questions** to AskAIRS. All have been answered.
  - 31 have been submitted so far in 2013
  - 81 were submitted in 2012
  - 94 were submitted in 2011
  - 60 were submitted in 2010

- Questions E-mailed directly to User Services (do not appear in AskAIRS)
  - 28 have been answered so far in 2013
  - 32 were answered in 2012
  - 75 were answered in 2011
  - 123 were answered in 2010

V6 Documentation is available at the DAAC and on the AIRS site
http://disc.sci.gsfc.nasa.gov/AIRS/documentation/v6_docs
http://airs.jpl.nasa.gov/data/v6/

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AIRS operational and research applications summary

Operational

- All AIRS products available within 3 hours of acquisition
- Spectral Radiances: assimilated into NWP forecasts worldwide
- Hurricane Maps for NASA Hurricane Portal
- Sulfur Dioxide: used by Volcanic Ash Advisory Center for aviation alerts

Research

- Temperature Profile
  - heat wave
  - temperature inversions / bad air quality
  - fire weather
- Water Vapor
  - drought index
  - mosquito habitat
- Carbon Monoxide
  - Asian air pollution
  - fire related pollution
- Ozone
  - hurricane strength
  - stratospheric ozone incursions
- Carbon Dioxide
  - global monitoring

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AIRS applications at SPoRT

- SPoRT - Short-term Prediction Research and Transition Center
- NASA project to transition unique observations and research capabilities to the operational weather community to improve short-term forecasts on a regional scale

AIRS Blog at
http://nasasport.wordpress.com/category/airs/

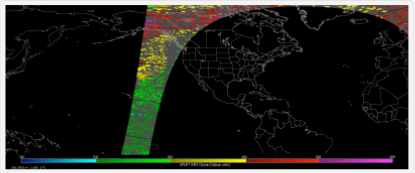
Improved Ozone Monitoring with the release of AIRS Version 6 data

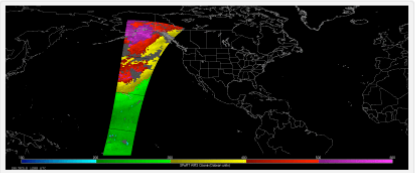
Posted in AIRS, tagged AIRS, ozone on March 18, 2013 | Leave a Comment »

Author: Emily Berndt

The AIRS project released AIRS version 6 data late last week. Significant improvements in data quality were immediately noticed here at SPoRT after the first image utilizing version 6 data was processed.

The first graphic is a plot of AIRS ozone utilizing version 5 data. You can see the gray regions, which represent gaps in the data and poor quality data due to cloud contamination. The second graphic is a plot of AIRS ozone utilizing version 6 data. There are far less gaps in data and data quality issues.

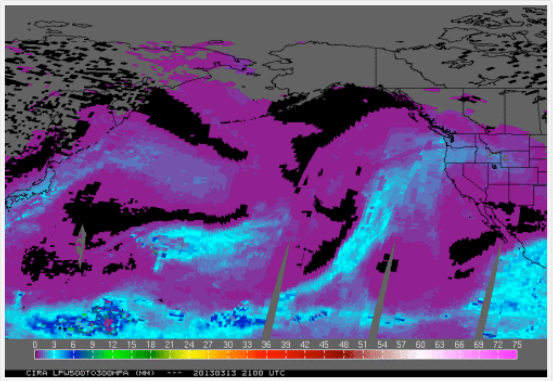

AIRS Ozone 1100 UTC March 14th 2013 utilizing version 5 data


AIRS Ozone 1200 UTC March 15th 2013 utilizing version 6 data

Moisture Plume in Layers

Posted in AIRS, CIRA Products, Passive Microwave, tagged LPW, moisture, plume, TPW on March 14, 2013 | 1 Comment »

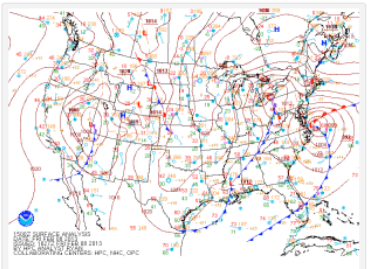
Moisture plumes from the tropical Pacific can extend into the mid-latitudes, and the CIRA Layer Precipitable Water (LPW) product based on microwave (AMSU, MHS) and infrared (AIRS) sounding instruments from NASA and NOAA polar-orbiting satelliltes provides information on the amount of moisture in each layer. Traditional total precipitable water (TPW) data only give part of the picture and Water Vapor (WV) imagery only captures the upper tropospheric moisture. Note here how the GOES WV imagery from the NASA GHCC site agrees well with the values of 2-4 mm in the 500-300 mb layer between Hawaii and the west CONUS.


500-300 mb Layer Precipitable Water by CIRA, 13 March 2013, 2100Z

Early February Northeast Blizzard

Posted in AIRS, CrIS, GOES-R Proving Ground, JPSS Proving Ground, MODIS, RGB, VIIRS on February 8, 2013 | 1 Comment »

The Northeast is bearing down for a blizzard as two storm systems are expected to merge off the East Coast early Saturday morning. Currently, one low pressure center is near Lake Erie and the other one is off the Virginia coast (see surface map below). Once the two systems phase off the East Coast, the new system is expected to rapidly deepen to 970 mb. Blizzard conditions will result as 1-2 feet of snow falls and winds gust to as high as 70 mph.


HPC 1500 UTC Surface Analysis Feb. 8, 2013

From a satellite perspective, how can some of the new GOES-R imagery and AIRS profiles help identify significant features associated with this unique synoptic set up? Below is an RGB Air Mass image from 0634 UTC this morning. The image gives a clear view of the coastal storm. Notice the green colors to the south of the main cloud shield, indicated by a blue arrow. The green colors represent warm, moist

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AIRS applications at SPoRT

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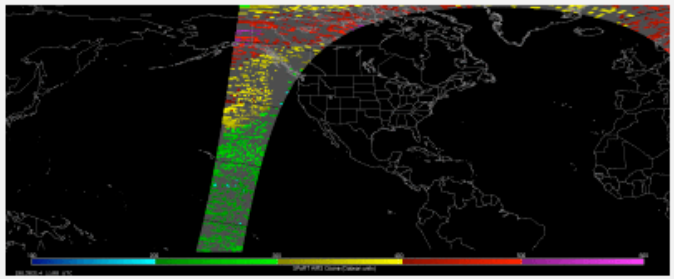

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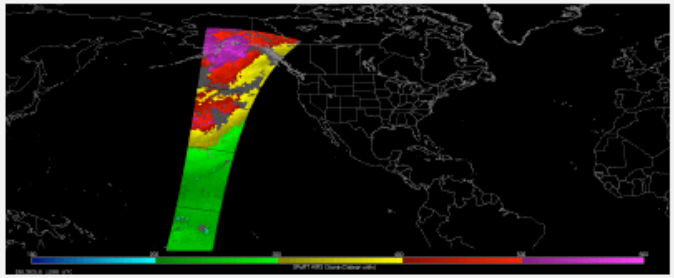

AIRS Ozone 1200 UTC March 15th 2013 utilizing version 6 data

- Blog on AIRS Total Column Ozone, showcases improvements in the quality of the V6 product
- SPoRT provides this product to the Weather Prediction Center and the Ocean Prediction Center in College Park, MD
- Forecasters use the product to identify regions of ozone-rich stratospheric air
- Identification of stratospheric air can help forecast high winds and cyclone strengthening

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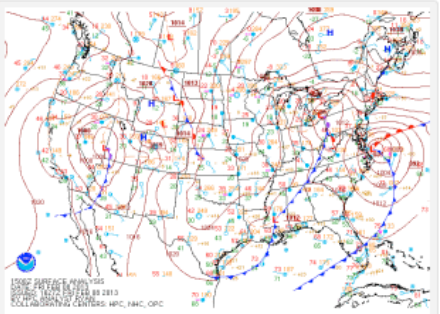

HPC 1500 UTC Surface Analysis Feb. 8, 2013

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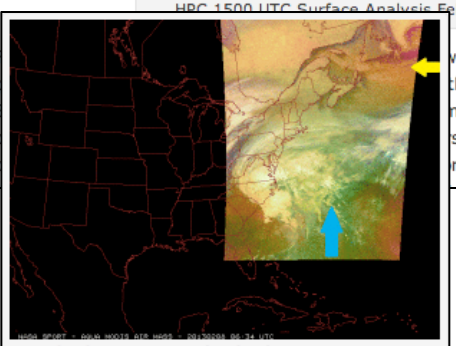
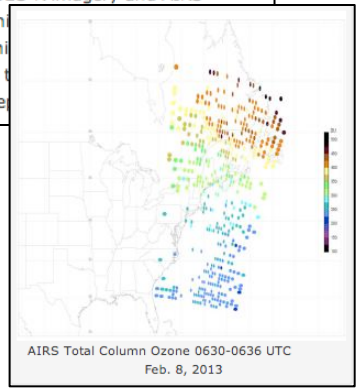


NASA SPoRT Aqua MODIS RGB Air Mass Image 0634 UTC Feb. 8, 2013.
Yellow arrow points to ozone rich stratospheric air and Blue arrow points to warm, moist tropical air.



AIRS Total Column Ozone 0630-0636 UTC Feb. 8, 2013

- Blog post communicates utility of using AIRS Total Column Ozone to confirm the presence of stratospheric air
- Surface map shows position of the low pressure system off the East Coast
- This storm produced high-impact hurricane force winds off the East Coast
- The AIRS ozone can help anticipate the production of high winds in developing cyclones. The higher values of ozone correlate with the suspected stratospheric air (orange) on the RGB Air Mass Image (Red, Green, Blue)
- RGB Air Mass Imagery is a new product - AIRS Total Column Ozone has helped confirm the presence of stratospheric air in the imagery

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AIRS applications at SPoRT

- SPoRT staff post on the blog was well as National Weather Service partners who evaluate SPoRT products.
- New blog posts are updated to the SPoRT Twitter and Facebook pages. Anyone with a Wordpress account can sign up for alerts when a new blog is posted.
- Depending on the popularity of the topic it can be **a few hundred to a few thousand viewers.**
- Audience tends to span NASA management as well as National Weather Service management and forecasters

AIRS Blog at
http://nasasport.wordpress.com/category/airs/

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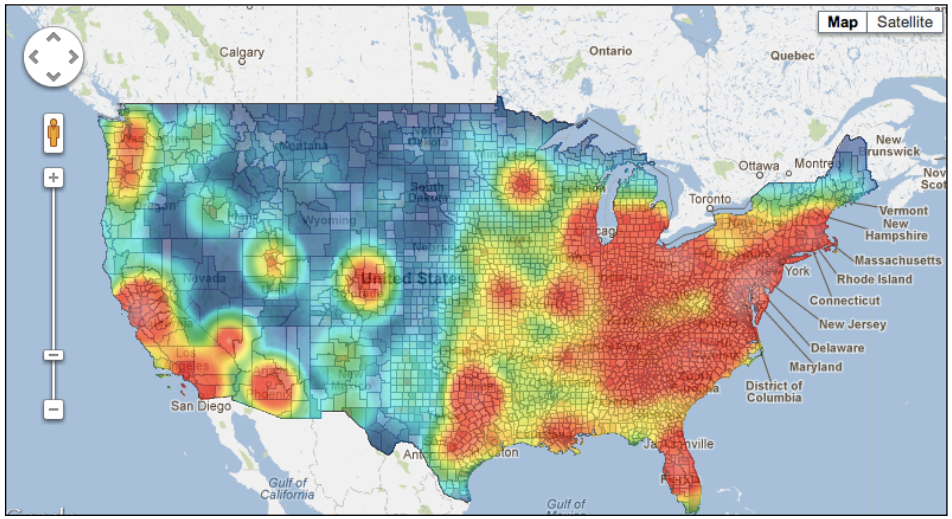
AIRS "Applications" browse tool

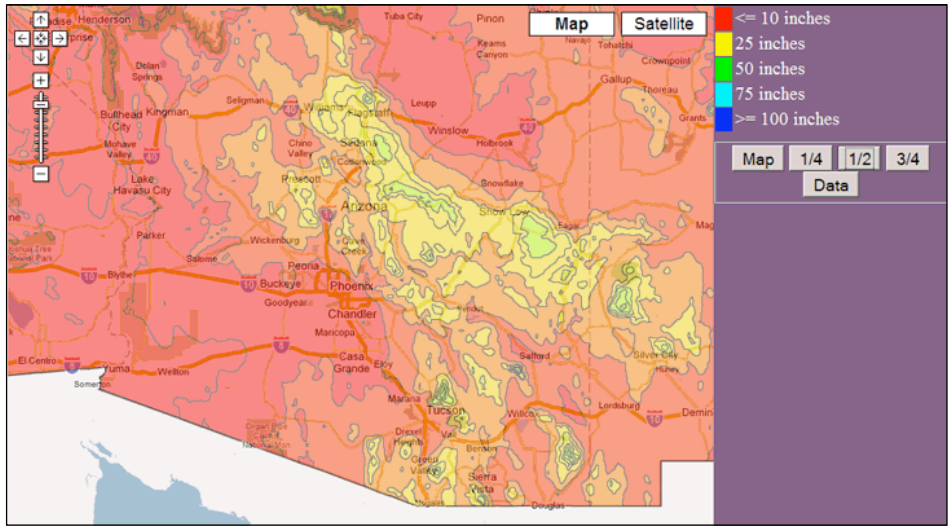
Overview

- browse tool for select AIRS maps
- optional Google Maps base layer
- notable events archive
- hosted on the AIRS public web site
- interface design/backend programming by Moore Boeck
- AIRS front-end data prep to be done by JPL
- review and guidance team

Capability

- map types: geophysical products, anomalies, applications, climatologies
- depending on the map, pulldown menus (or other mechanism) allow for options. Example, temperature can be surface/700mb/500mb
- display the companion AIRS Vis image
- notable events archive (features AIRS science comments for each map)
- zoom and pan capability (pre-determined regions?)
- Google map underlay (user can switch this on or off)
- variable transparency overlay (ie. the AIRS map)
- animation
- download the image or animation
- broadcast quality versions of maps/animations
- move map to a message board to allow for comments
- share map (email, facebook, instagram, ?)





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AIRS web site - retooled to last to end of mission

- New backend CMS for multiple maintainers
- Designed to scale for tablets, mobile devices
- All content reviewed, updated, simplified, with researcher in mind
- Will link to Flickr (image), YouTube (video), Issu (documents) to take advantage of existing repositories
- Publications database simplified
- AskAIRS - new message board
- Designed by Moore Boeck
- 8 milestones through 9/30/13

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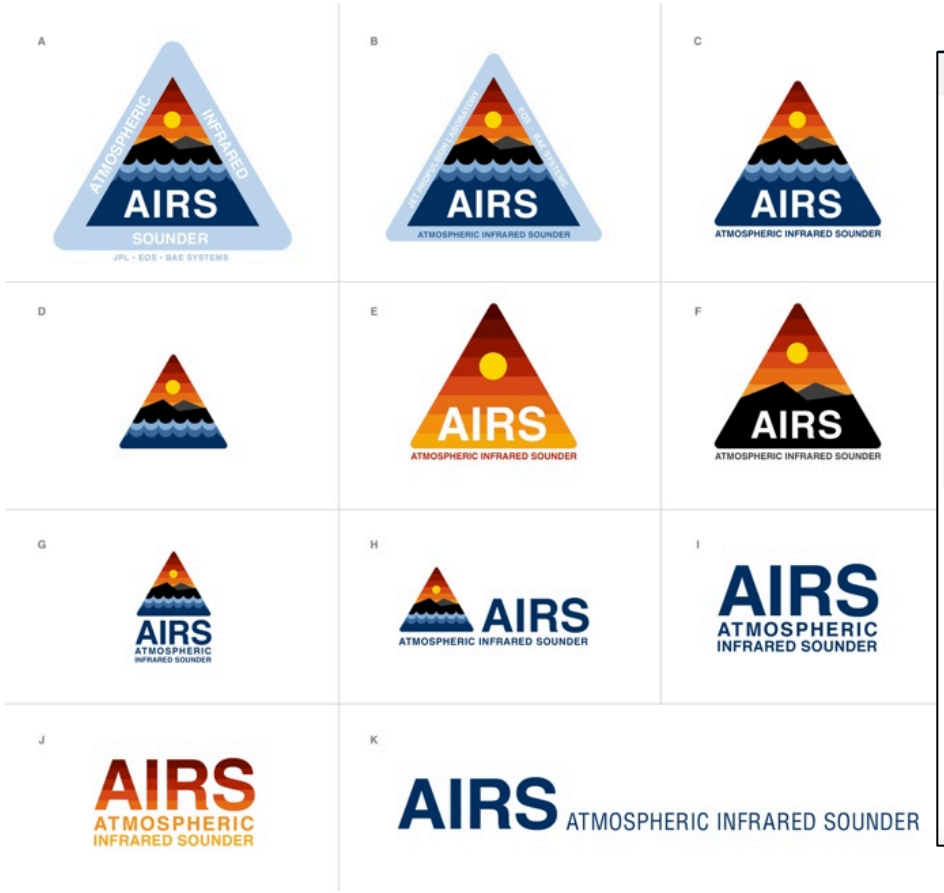

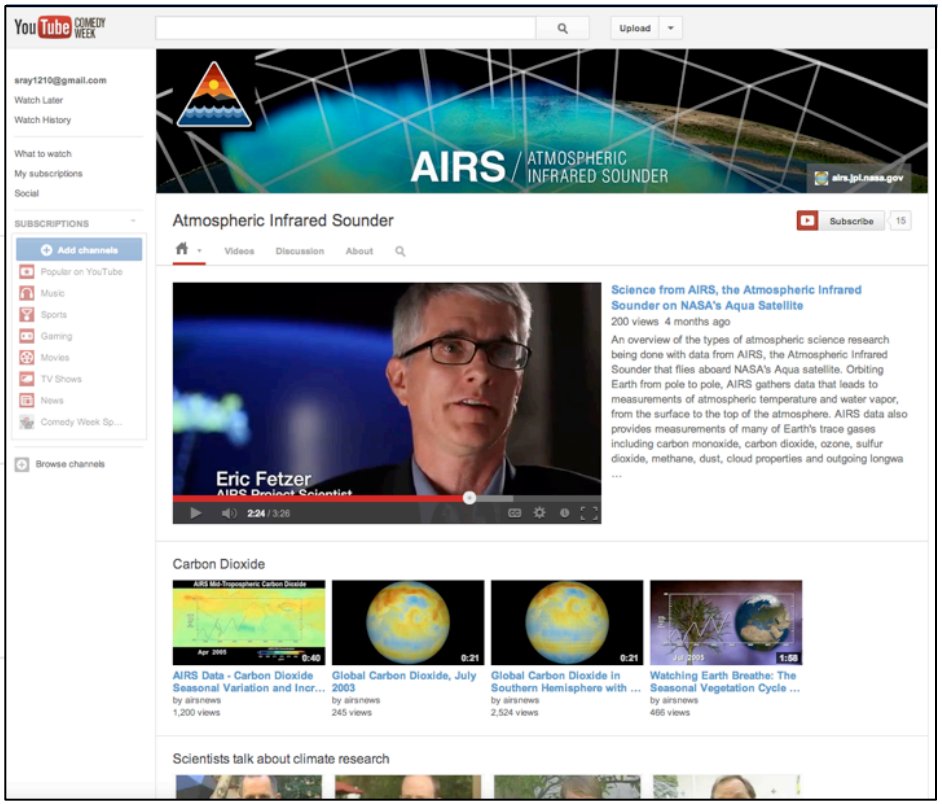

http://www.youtube.com/user/airsnews

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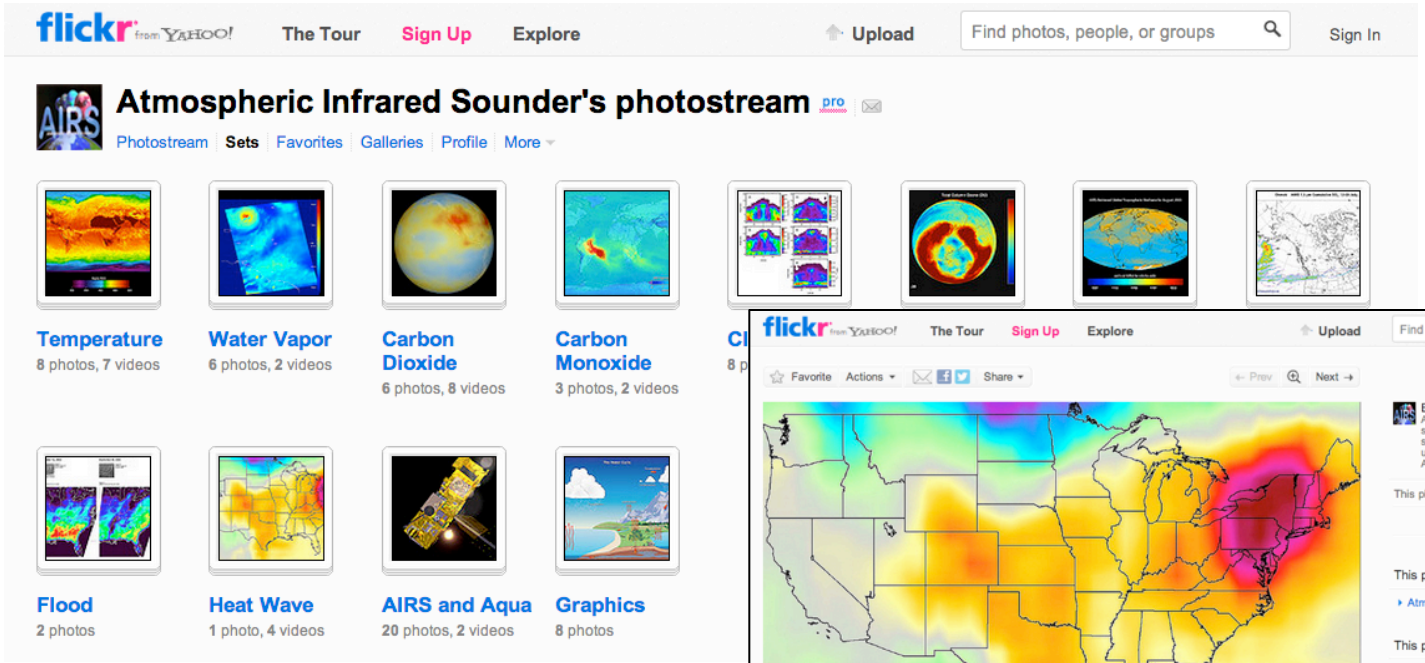

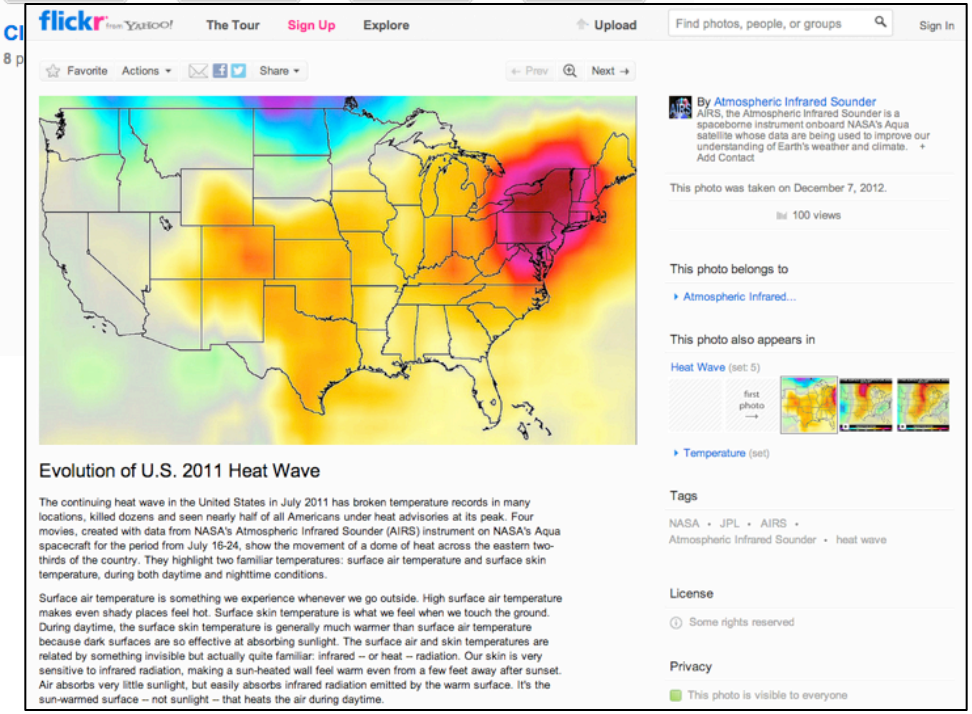

http://www.flickr.com/photos/atmospheric-infrared-sounder/sets/

Google Analytics

http://airs.jpl.nasa.gov - http://airs.jpl.nasa.gov
AIRS [DEFAULT]

Apr 19, 2013 - May 19, 2013

Pageviews	Unique Pageviews	Avg. Time on Page
11,008	8,349	00:01:26

	Page	Pageviews	% Pageviews
1.	/	2,055	18.67%
2.	/maps/satellite_feed/atmosphere_layers/	1,387	12.60%
3.	/data/get_AIRS_data/	676	6.14%
4.	/image_gallery/gases/	343	3.12%
5.	/instrument/how_AIRS_works/	317	2.88%
6.	/mission/description/	278	2.53%
7.	/science/geophysical_science/	229	2.08%
8.	/documents/publications/	228	2.07%
9.	/AIRS_CO2_Data/	213	1.93%
10.	/climate/	211	1.92%

	Source / Medium	Visits
		4,535 % of Total: 100.00% (4,535)
1.	google / organic	2,808
2.	(direct) / (none)	835
3.	search.nasa.gov / referral	180
4.	bing / organic	84
5.	yahoo / organic	81
6.	facebook.com / referral	43
7.	disc.sci.gsfc.nasa.gov / referral	38
8.	nasa.gov / referral	38
9.	airs-dev2.jpl.nasa.gov / referral	37
10.	jpl.nasa.gov / referral	25

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6.	facebook.com / referral	43
7.	disc.sci.gsfc.nasa.gov / referral	38
8.	nasa.gov / referral	38
9.	airs-dev2.jpl.nasa.gov / referral	37
10.	jpl.nasa.gov / referral	25

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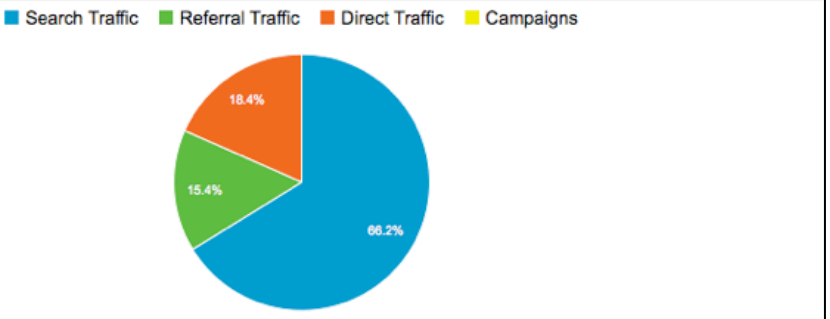
Google Analytics

http://airs.jpl.nasa.gov - http://airs.jpl.nasa.gov
AIRS [DEFAULT]

Apr 19, 2013 - May 19, 2013

4,535 people visited this site



Search Traffic
- Keyword
- Matched Search Query
- Source

Referral Traffic
- Source

Direct Traffic
- Landing Page

Campaigns
- Campaign

	Keyword	Visits	% Visits
1.	(not provided)	1,588	52.88%
2.	airs	282	9.39%
3.	airs satellite	32	1.07%
4.	atmosphere layers	27	0.90%
5.	http://airs.jpl.nasa.gov/maps/satellite_feed/atmosphere_layers/	25	0.83%
6.	airs data	22	0.73%
7.	airs nasa	21	0.70%
8.	layers of earth's atmosphere	19	0.63%
9.	airs instrument	18	0.60%
10.	airs jpl	18	0.60%

	Country / Territory	Visits
		4,535 % of Total: 100.00% (4,535)
1.	United States	2,577
2.	United Kingdom	196
3.	Canada	164
4.	India	141
5.	Germany	102
6.	France	98
7.	Japan	91
8.	Australia	81
9.	Brazil	81
10.	Malaysia	58